RainScapes for Healthy Watersheds

From Rooftops to Rivers,

Reducing Pollution One Yard at a Time

Forest Estates

March 16, 2011

Department of Environmental Protection

Montgomery County Maryland

The RainScapes Program
Getting to the Source

- Residential Urban Stormwater Management
  - Reduce Stormwater Runoff Volume
  - Reduce Pollution from Neighborhoods
  - Recharge Groundwater and Stream Baseflow

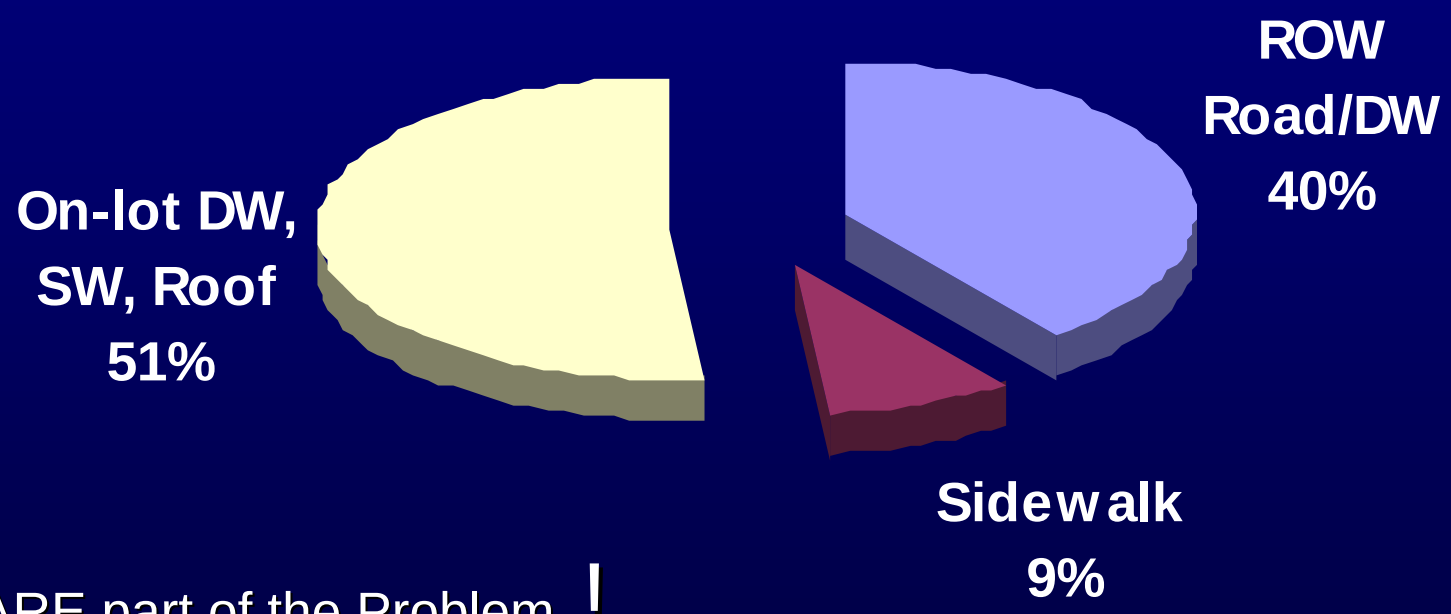
- Water Conservation and Habitat Diversity
  - Native Landscapes
  - Harvesting and Reuse

- Empowering Individual Actions

Rooftops

In typical urban residential areas, rooftops account for 30-40% of the total impervious area

Forest Estates Impervious Cover



We ARE part of the Problem !

Good News Is…

We are also a big part of the solution

RainScapes Initiative

- **County Incentive Funding**
  - Rebate Program
  - RainScapes Neighborhood Approach
  - Watershed Organization Partnerships
    - **Friends of Sligo Creek**
- Targeted areas within the Lower Rock Creek and the Anacostia
  - Sligo Creek (targeted subwatershed)
  - Ken-Gar *
  - Turkey Branch *
  - Town of Chevy Chase (Coquelin Run)
  - Stoneybrook/Parkside/Garrett Park
  - Glen Echo Heights

- Initiate projects with commercial sector *

RainScapes Neighborhoods

- Reduce residential runoff in a measurable way
- Promote community participation
  - Widespread implementation!
  - Can we achieve measurable results?
  - Neighborhood collaboration
- Research and monitoring
  - Promote partnership and project innovation – Friends of Sligo Creek and GWU
  - Unique neighborhood conditions

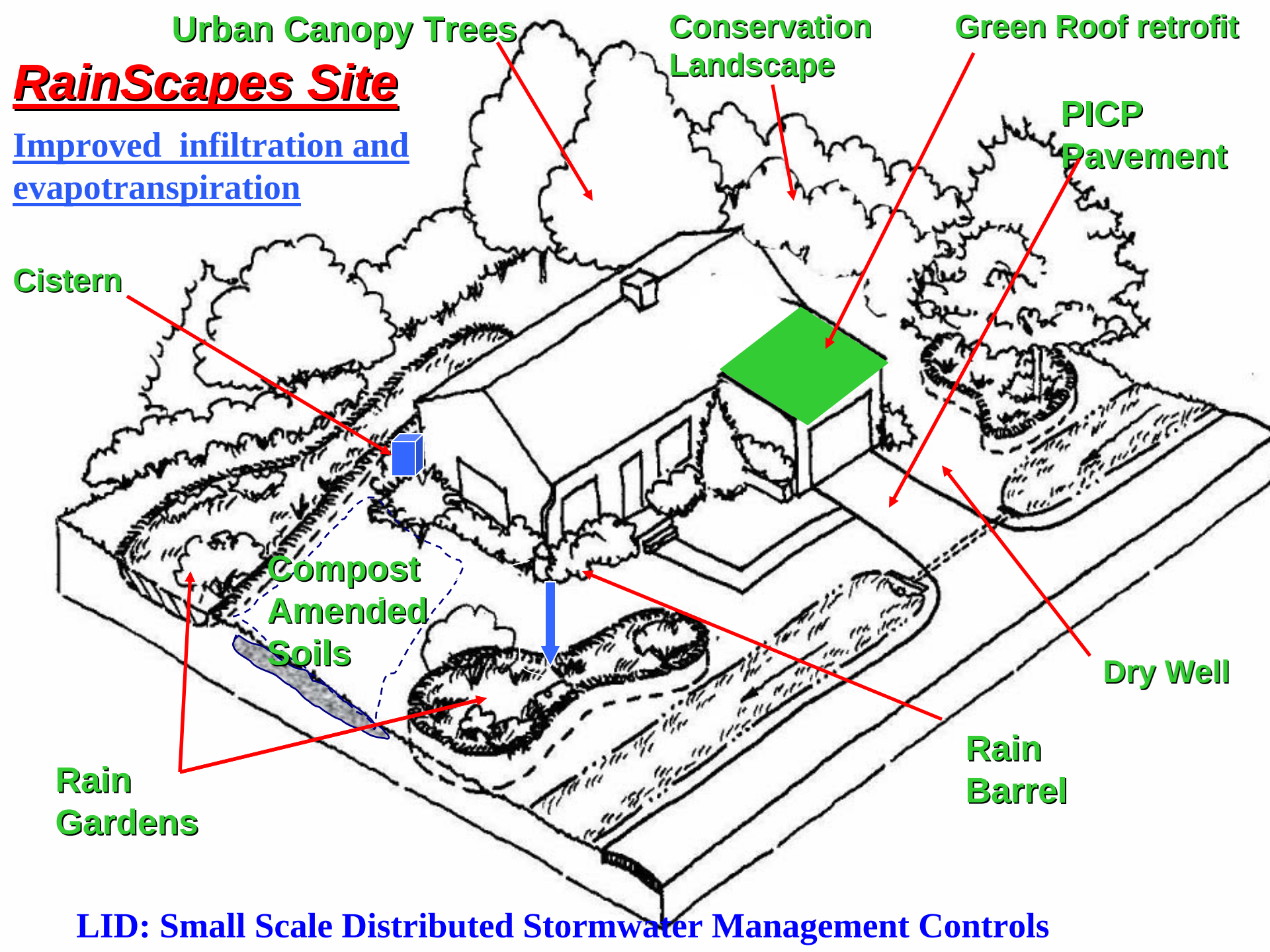
Neighborhood Project Elements

- Neighborhood Assessment and Surveys
  - opportunities and constraints
  - potential project sites
- Modeling and Hydrologic Studies – volume reduction
- Project Templates and Installation Plans
- Resident Workshops and Participation Agreements
- Implementation Plan and Installation – Spring and Fall 2011
  - Angler Environmental – County Contractor installed
  - or Property Owner installed w/ rebate up to $2,400
- ***Next Steps – what to expect in the near future***
  - ***Survey has been distributed, and now planning project focused public workshops***

What are RainScapes Techniques

A wide range of natural drainage options

- Downspout Diversion
- Rain Barrels, Cisterns (water re-use)
- Rain Gardens
- Permeable Pavers
- Green Roofs
- Native/Naturalized Landscaping
- Urban Tree Canopy
- Pavement Removal
- Dry Wells
- Soil Reconditioning and Amendment

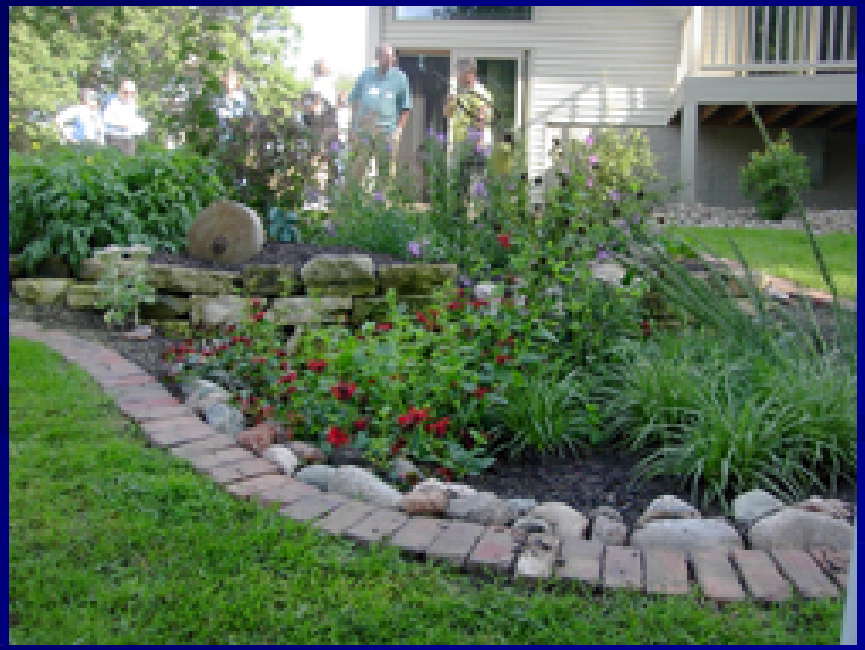


LID: Small Scale Distributed Stormwater Management Controls

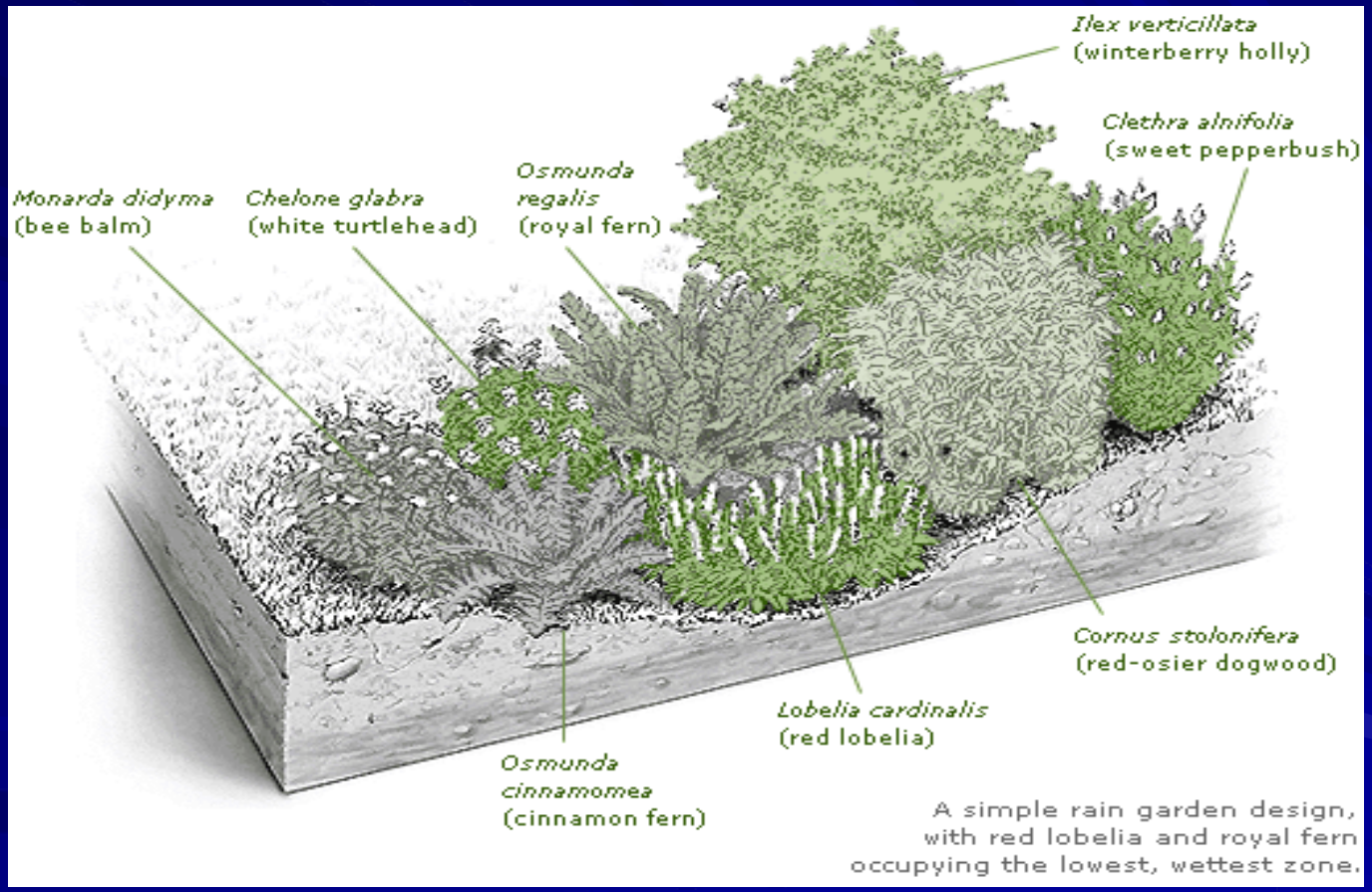
Rain Gardens

Rain Gardens

- Sized to treat at minimum the 1.0” rainstorm but the goal is to treat the 2.7” rainstorm volume from impervious surface contributing to rain garden (1 year storm)

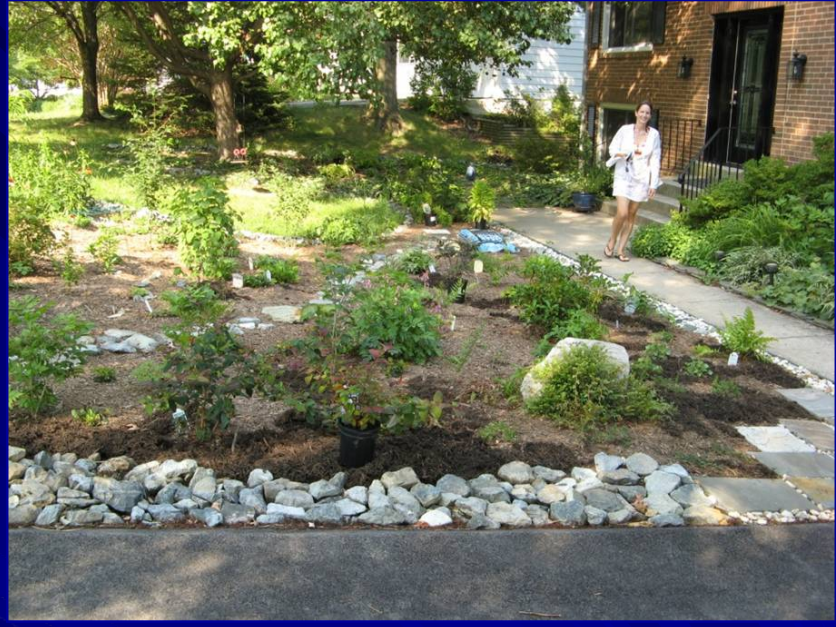


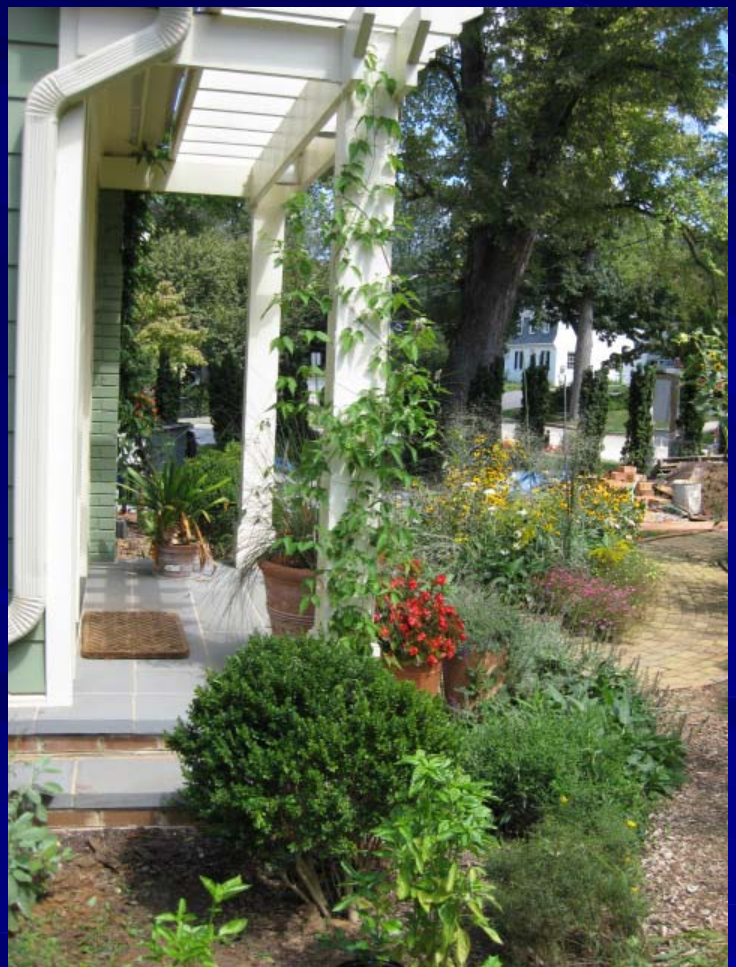
Rain Garden Designs



Conservation Landscaping

- Must convert at least 250 sf of turf area to 75% native plantings

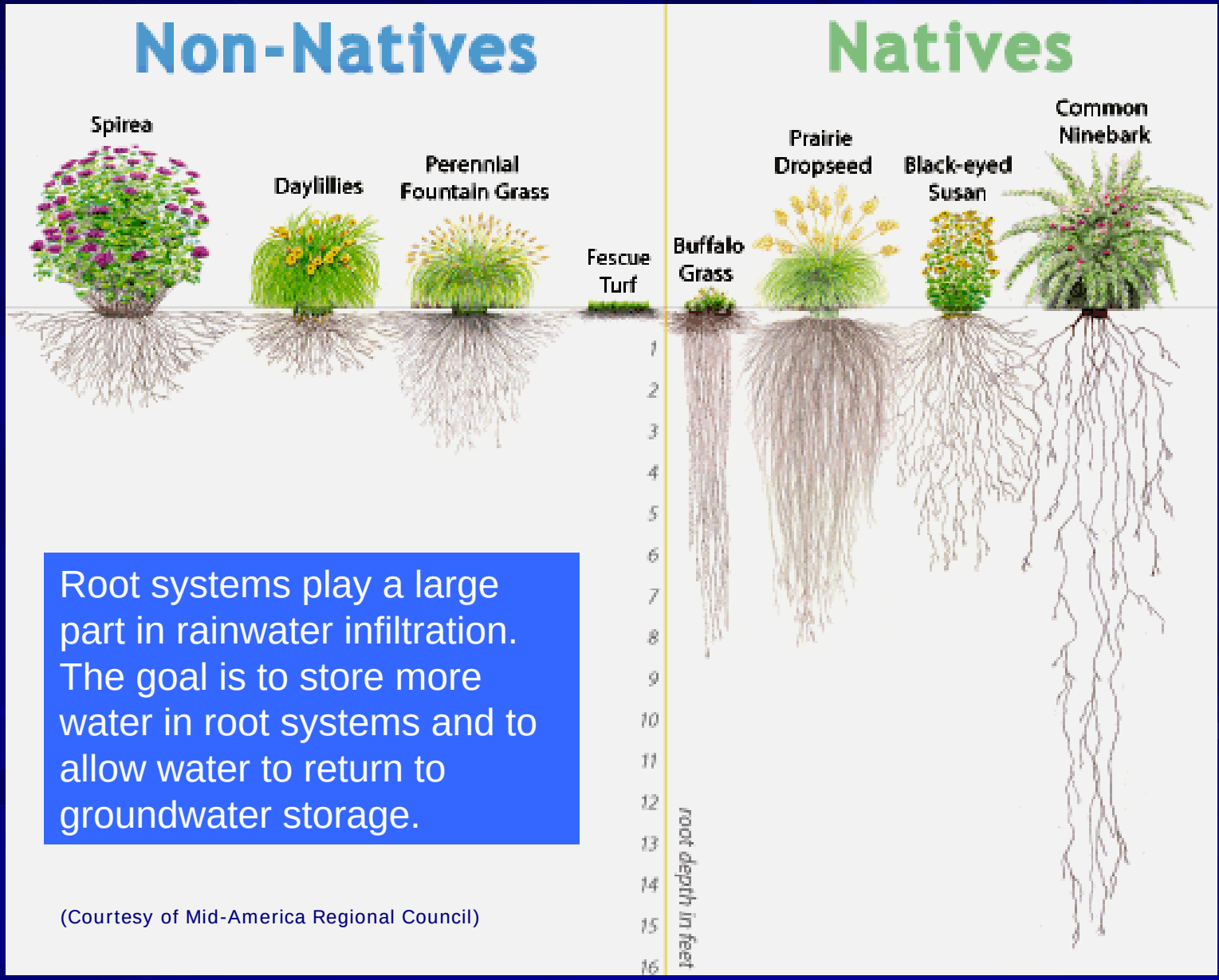




Conservation Landscaping
Reduce Lawn Compaction

- Regionally Native Species
- Moist Conditions AND Drought Tolerant
- Seasonal Interest – Successive Bloom
- Improved Stormwater Infiltration
- Reduce Pollutant Loads
- Habitat Diversity
- Many Sources of Info
- Many Related Ecosystem Benefits
  - Air Quality, Energy, Pollinators, Biodiversity

Why we care about roots!

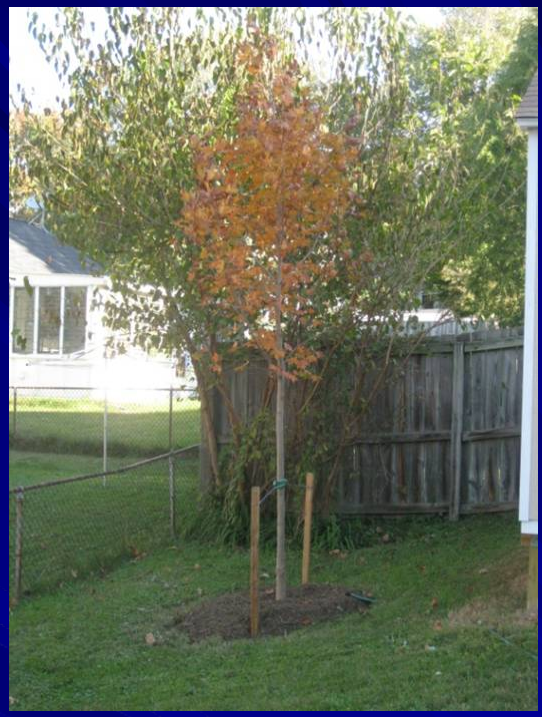


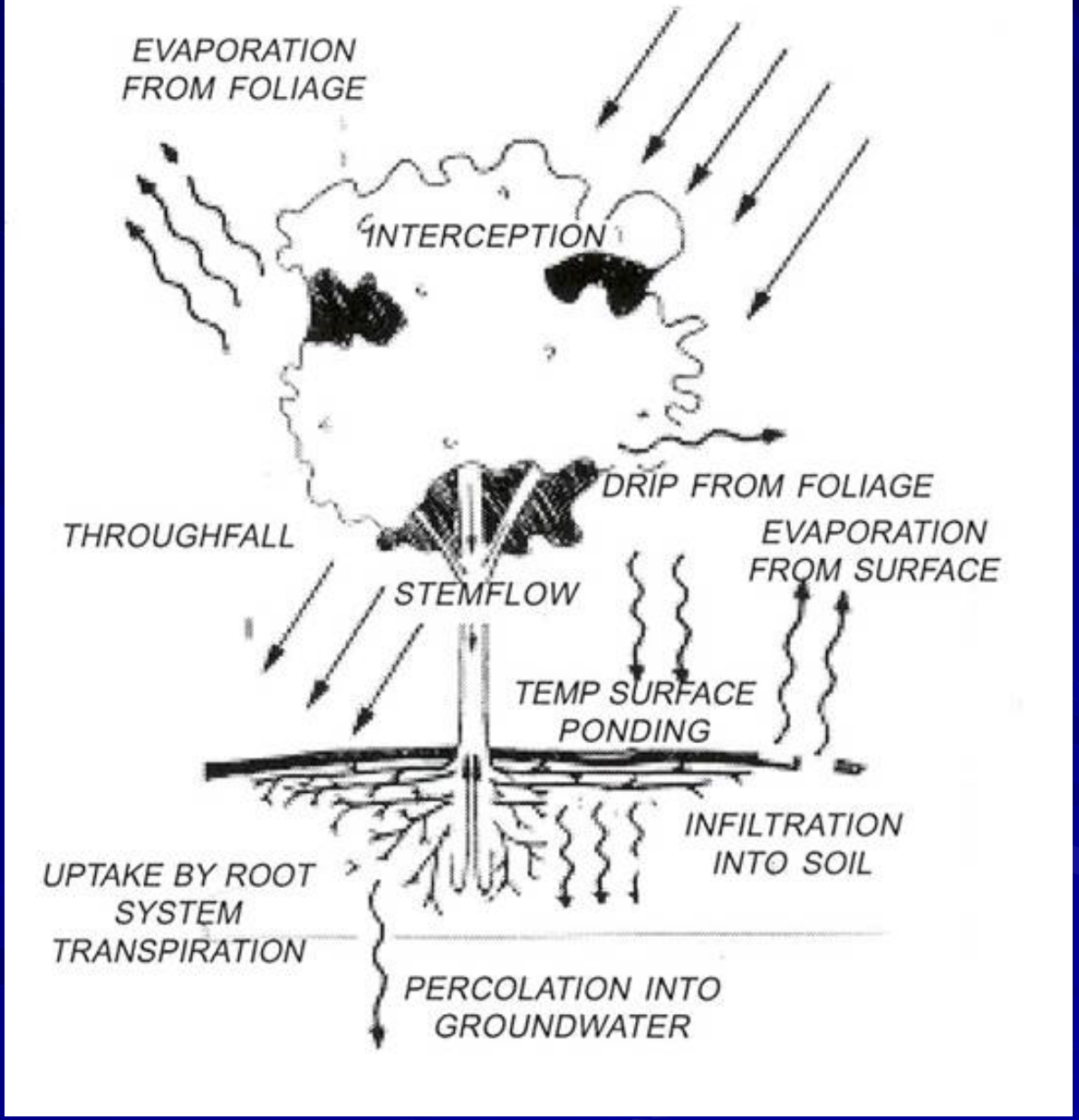
Root systems play a large part in rainwater infiltration. The goal is to store more water in root systems and to allow water to return to groundwater storage.

(Courtesy of Mid-America Regional Council)

Tree Canopy

- Must be providing shading of AC or impervious surface, must be a native canopy tree




EVAPORATION
FROM FOLIAGE
INTERCEPTION
DRIP FROM FOLIAGE
THROUGHFALL
EVAPORATION
FROM SURFACE
STEMFLOW
TEMP SURFACE
PONDING
INFILTRATION
INTO SOIL
UPTAKE BY ROOT
SYSTEM
TRANSPIRATION
PERCOLATION INTO
GROUNDWATER

Permeable Paver Retrofits

- Must be for conversion of existing hardscape and be a minimum area of 150 sf

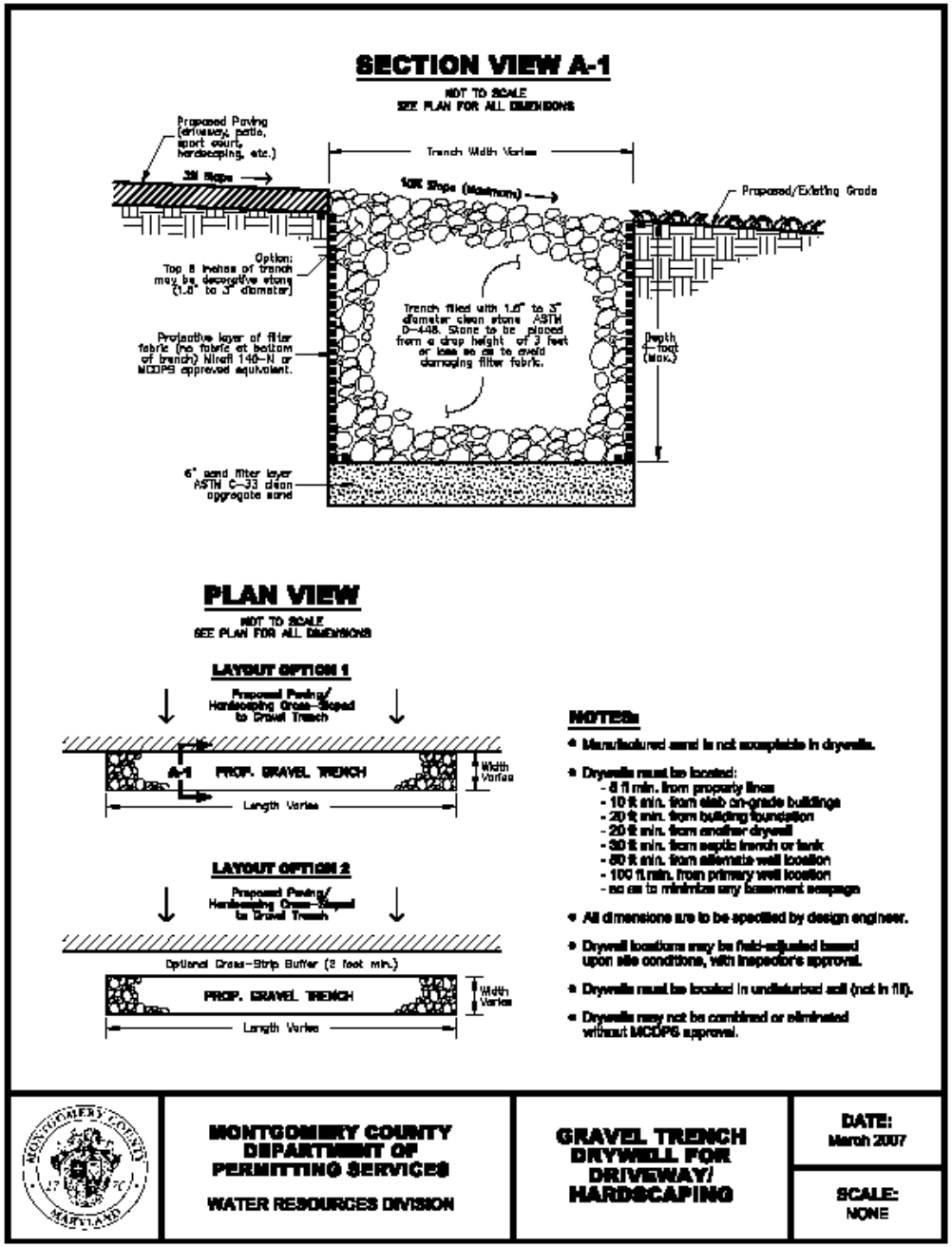
Rain Barrels

Cisterns

must capture 250 gallons

- Exterior irrigation only
- Many types
- Need adequate area to empty it

Driveway Dry Wells



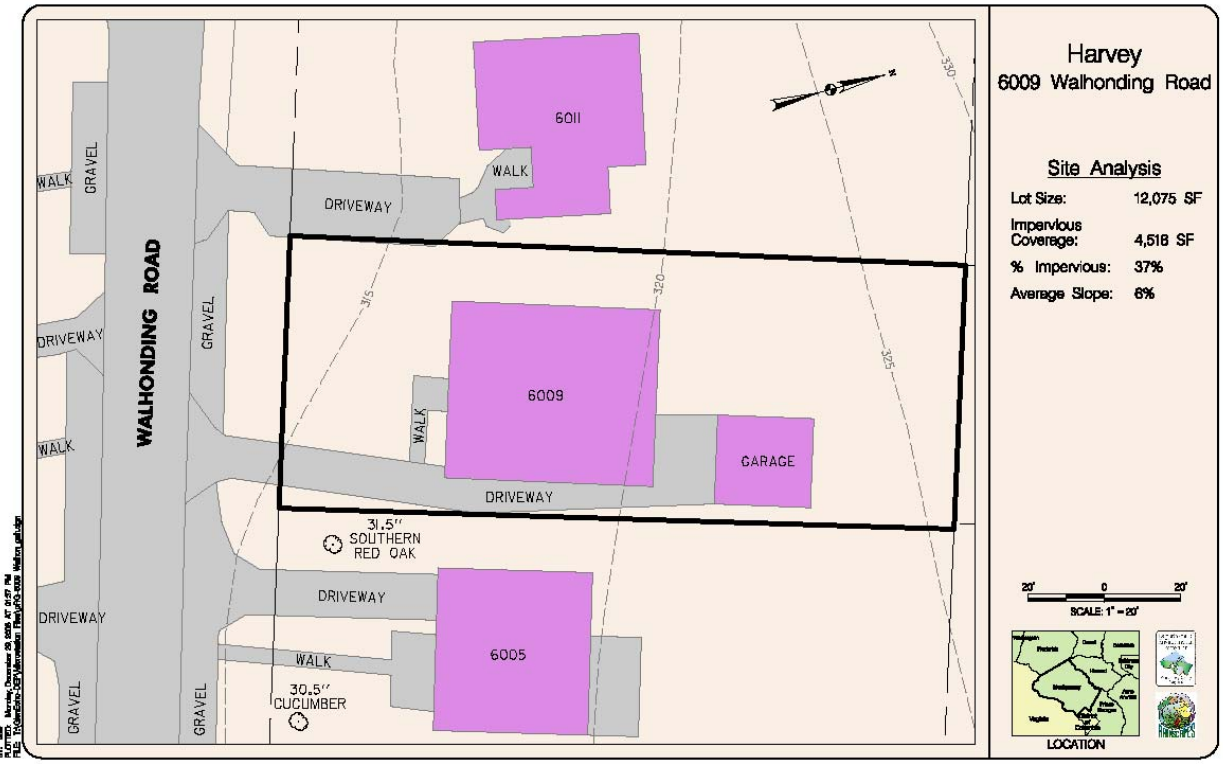
Techniques: Soil Reconditioning and Amendments

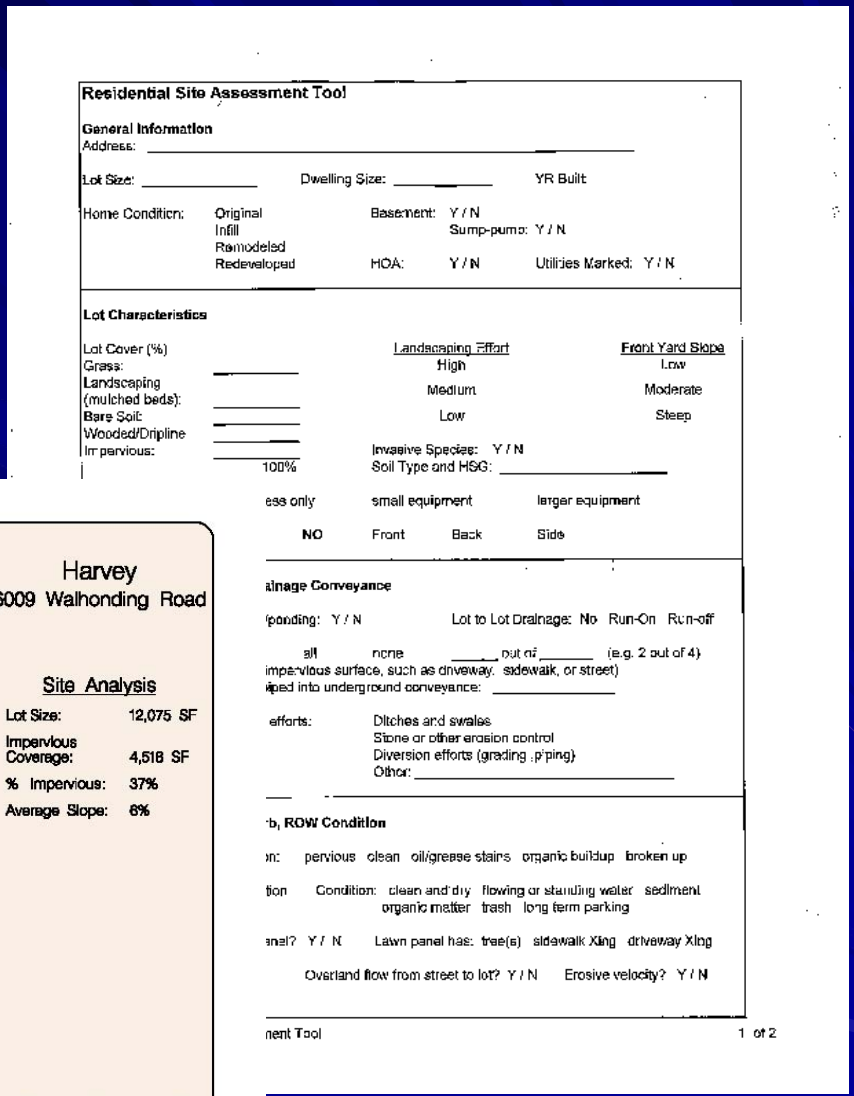
Healthy soils and infiltration

- Mass grading during construction leaves little or no top-soil and compacted yards
- Intensive turf-grass culture can lead to highly compacted soils
- Test: Soil nutrients, organic content and compaction
- Add: Organic material and aeration
- **This Year – Focus on Research and Education**

Next Step: doing a site by site assessment of on-lot possibilities

- Draw in downspouts, flowpaths, roof peaks, landscaped areas that you don't want to disturb
- Identify an area for a rain garden or other project
  - Can extend gutters, use small drainage contours to direct runoff
- Calculate space needed and space available





Residential Site Assessment Tool

General Information

Address: _____

Lot Size: _____ Dwelling Size: _____ YR Built

Home Condition: Original / Infill / Remodeled / Redeveloped

Basement: Y / N

Sump-pump: Y / N

HOA: Y / N

Utilities Marked: Y / N

Lot Characteristics

Lot Cover (%)

Grass: _____

Landscaping (mulched beds): _____

Bare Soil: _____

Wooded/Dripline _____

Impervious: _____

100%

Landscaping Effort: High / Medium / Low

Front Yard Slope: Low / Moderate / Steep

Invasive Species: Y / N

Soil Type and HSG: _____

ess only small equipment larger equipment

NO Front Back Side

ainage Conveyance

ponding: Y / N Lot to Lot Drainage: No Run-On Run-off

all none _____ out of _____ (e.g. 2 out of 4)

impervious surface, such as driveway, sidewalk, or street)

ped into underground conveyance: _____

efforts: Ditches and swales

Stone or other erosion control

Diversion efforts (grading, piping)

Other: _____

b, ROW Condition

n: pervious clean oil/grease stains organic buildup broken up

tion Condition: clean and dry flowing or standing water sediment organic matter trash long term parking

anel? Y / N Lawn panel has: tree(s) sidewalk Xing driveway Xing

Overland flow from street to lot? Y / N Erosive velocity? Y / N

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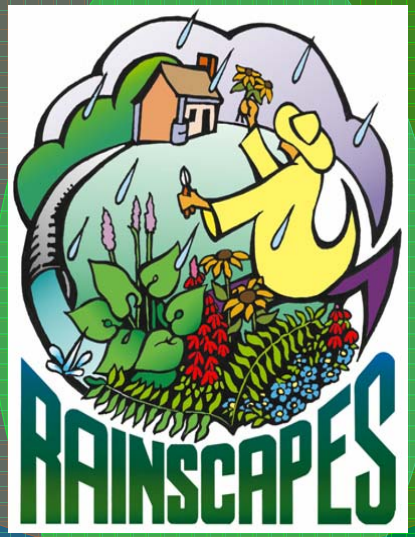
Properties/ Owners

- Individual homeowners
- Businesses
- Institutions
- Multi-family…

MS4 Permit Stewardship



- Nurseries
- Landscape Designers
- Remodeling contractors
- Landscape Architects
- Pavement contractors
- ….

Green Contractors

- Stormwater management
- Canopy Cover Restoration
- LID
- Solid Waste
- Stream Monitoring.

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